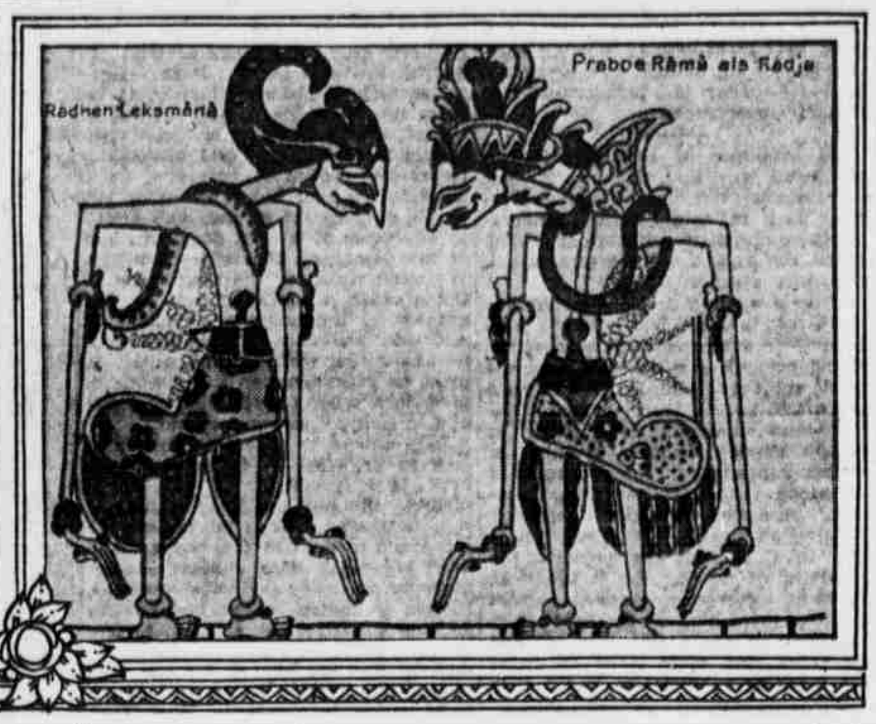
Buddha 1,300 Years Ahead of Us in Making Batiks Fashionable

Present Popularity of Batiked Garments Prompts a Look Backward to a Fat and Mysterious God Whose Styles Still Prevail in Java

Javanese Women Use Ancient Methods and Designs Handed Down for Generations—New Process Permits Washing Without Injury



THESE ARE NATIVE JAVANESE CARTOONS OF NATIVE JAVANESE THEATRICAL COSTUMES CARRIED OUT IN BATIK-DESIGN FABRICS.

By DOROTHY DAY.

GRANDMOTHER used to put away her old dresses, saying meanwhile to mother (she was a frugal soul): "This will be in style again twenty years from now, so I'll save it for you." And sure enough, twenty years after mother took from the chest in the attic the beautiful old velvet or silk—they were fine materials in those days—and with a slight stitch here and there and a little renovation wore it to the Vanderbilt for dinner. And everybody said, "Isn't that woman stunningly gowned!"

Nowadays designers aren't looking back twenty years to see what Miss New York will wear this winter. They are looking back 1,300 years to a fat and mysterious Buddha perched all along among ruins in the interior of Java. And they are admiring the design on the bath towellike arrangement that is draped around the god.

Buddha was wearing batik 1,300 years ago thousands of miles from the island of Manhattan. Indeed there was no island of Manhattan then. This winter women who can afford it are wearing batik gowns, batik hats, batik bags, yes, even batik nighties and teddy bears. The omniscient eye of the fat Buddha twinkles as he looks.

Styles don't change in Java. Javanese women make all the clothing for the family—they don't wear much—and the baby toddling around the hut and the little girl that watches him to see that he keeps out of the geyser puddles and other bits of tropical scenery and papa working in the fields—all of them wear beautifully batiked three piece garments.

Making batik is just part of the ordinary housework in Java. Mrs. Javanese takes some white cotton material and puts it in soak in castor oil for a week, taking it out now and then to wash it and then putting it back in again. This makes a beautiful soft creamy shade. White is the color of death in Java. It is used only for mourning and for the grave. The castor oil also lends the material the necessary stiffness to accommodate the batik.

Then after the castor oil is washed out of the material and it is dried in the sun, Mrs. Javanese draws the design on the goods with charcoal. Usually it is a design that has been in the family for years and years. If it is one of the conventional Javanese designs it has to conform to the class of the wearer. It wouldn't do for Mr. Javanese Ordinaire to be seen walking down the street wearing the royal or aristocratic colors.

If Mrs. Javanese is of a radical and daring mind, she copies the simple conventional design that she sees on a Europeans tourist's dress or hat and the result is not half so pretty. But she thinks it is. She is a simple soul. Then she paints the design in the material on both sides with hot beeswax and when it has cooled and hardened, dips it into the vegetable dye. To get the wax off she scrapes it with a knife and beats it against the rocks and dips it in hot water. Another design is made and waxed and the material is once again dyed. This process is repeated as many times as there are colors in the design.

Designs Long in Making.

The wax crackles in handling, very often, and the dye seeps through, leaving a marbled effort on the cloth. This was thought at first to be an example of bad workmanship, and avoided as much as possible. But as time went on, people came to admire the crackled effect and strove for it.

It takes Mrs. Javanese a long time to make the costume, but one dress lasts her a whole year and she doesn't wear anything else. Buddha wore batik. So did all their gods and goddesses. Mr. and Mrs. Javanese had to also.

When the Dutch in 1648 discovered Java, the explorer, who was of an artistic nature, sent home samples of designs and descriptions of the beautiful work. But it wasn't until ten years ago that artist designers and the ladies of fashion decided that batik silk blouses and dresses were the thing. It took people a long time to discover tobacco, too.

Pieter Mijer, a Dutch artist of some reputation, brought batik with him to America ten years ago. At first the public would not recognize it. Pieter Mijer was an antique dealer at the time, repairing and reconstructing antique furniture. Batik was then only his hobby. Gradually other artists took it up, not to make a living from it but to furnish and beautify their homes. They made curtains, window hangings and tapestries of batiked silk. Under the tutelege of Pieter Mijer they simplified the Javanese method. As first the unscientific idea was that because the Javanese had followed a certain process in making batik for thousands of years the modern artist must make it in the same way.

But American artists learned that silk does not have to be waxed on both sides; that all materials, velvets, satins, linen, leather, can be batiked; that the wax can be applied with a brush instead of with a tjangtjing (a little brass or copper kettle that looks like a tea pot), and that artificial dyes could be used with even more success than vegetable dyes.

Next the artistic element of the city took to wearing batik as well as decorating the home with it. Smocks and scarves were created that attracted the attention of the more wealthy and stylish portion of the city. And gradually the lady of fashion took to placing orders for gowns and hats and blouses with artists who now devoted all their time to making batik. It was no longer a hobby.

Pieter Mijer, who now is known as the foremost batik maker in America, taught many young artists the work. Unfortunately some of these artists do not follow the ancient method of the Javanese. By outlining a design in wax instead of filling it in, then by painting it in instead of dyeing it they turned out imitation batik in great quantities. Fortunately the deception is easily discovered. The material has not that delightful crackly effect and irregularity of design that makes the work so charming.

At the present day there are studies all over the city where a number of artists work together, supplying the demand of the large department stores. If you walk up Fifth avenue you will see on display in the windows the batik that has now reached the zenith of its popularity.

The first exhibition of batik has been held at the Bush Terminal Building within the last month. A tapestry balked by Pieter Mijer and designed by Arthur Crisp was only one of the gorgeous pieces of work displayed.

According to a report of a bureau of commerce in the far East, there are one hundred species of plants containing color principles, but the colors are inferior in quality, fugitive, or not clear. Plants yielding dyes are widely scattered so the supply is unreliable and insufficient.

Artificial dyes, originally supplied the United States by Germany before the embargo put an end to exports, have now been perfected here at home by chemists, and the colors are as fast as the best and most primitive vegetable dyes. In batik, however, the color cannot be oiled in on account of the wax design. The silk is dipped in a cold bath and when the garment is complete it can be cleaned only by dipping in gasolene.

This has been one of the objections to batik—that it cannot be washed. But that difficulty as all others has been overcome. Miss Helen Maulby, an artist and illustrator, has perfected a process which makes it possible to batik the most delicate and flimsy lingerie. Up to this time artists have been using the Javanese decoration on dresses, scarfs, hats, lampshades, curtains, theatre hangings, furniture covers—in fact for everything but garments for boudoir use. The work that Miss Maulby turns out can be washed in soap and water without the slightest injury to the material.

Henri, the Javanese dancer, has the finest collection of Javanese costumes in the United States. The illustrations printed with this article, which were brought from Java by this talented pupil of Ruth St. Denis, represent Javanese gods. You will notice that the garments they wear are batiked according to the Javanese design.

Persian Design Best.

Most of the artists that are doing this designing follow the Persian designs, which are less intricate and colorful. Some of the artists follow the Japanese school, which conventionalizes nature. Pine trees, winding brooks, fish, birds, flowers and butterflies, and occasionally a house or two find their way into the design. Japanese design is not all dragons and wistaria blossom, as most people seem to think.

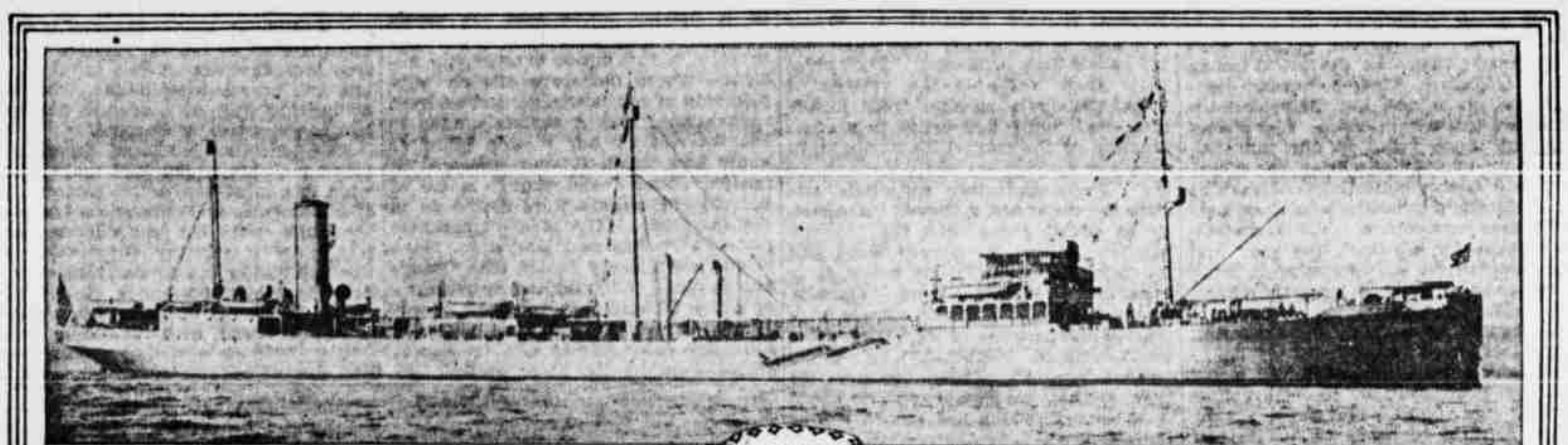
Yes, thirteen hundred years ago, Buddha in far away Java wore batik. And to-day, in the centre of New York, chorus girls are shimmying in beautifully batiked costumes. The costumes for the Greenwich Village Follies were all made by Pieter Mijer. The costume once worn by ascetic high priests and the gods now graces exotic chorus girls.

Times have changed.

United States Merchant Mariners Need to Watch the Still Engine

In Fuel Economy It Beats Even the Diesel, a Revolutionary Marvel in Its Time.

Has Met All Tests, and Promises To Be Equally Valuable on Land and on Sea.



TANKER THAT SUPPLIES LIQUID FUEL

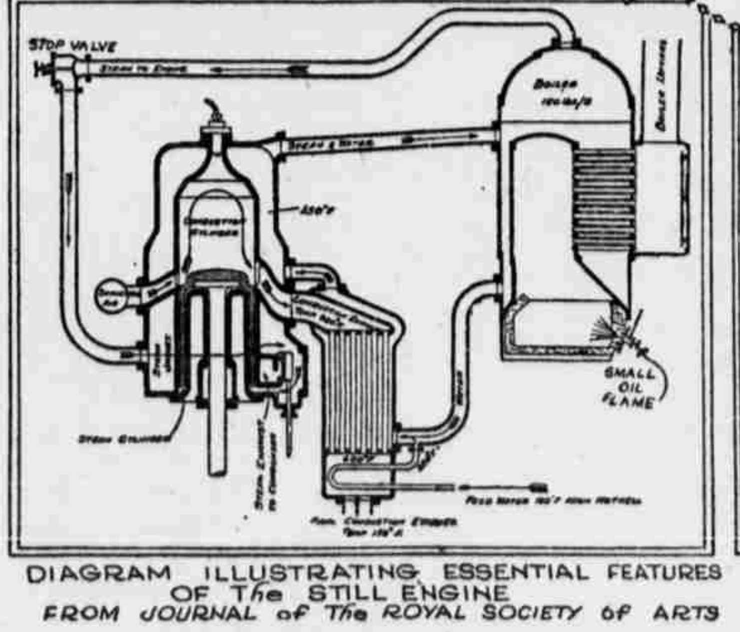
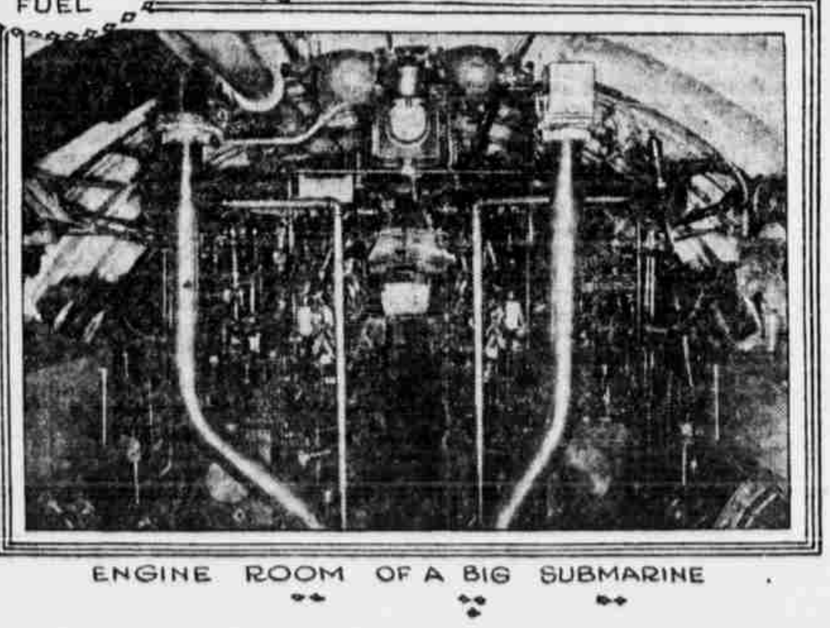


DIAGRAM ILLUSTRATING ESSENTIAL FEATURES OF THE STILL ENGINE
FROM JOURNAL of The ROYAL SOCIETY of ARTS



ENGINE ROOM OF A BIG SUBMARINE

By ROBERT G. SKERRETT.

THE latest marvel in the realm of mechanics is the gas steam engine, the product of an Englishman, W. J. Still. It is said that this novelty is a distinct advance even upon the Diesel motor, which itself was revolutionary in its effect.

In order that the man in the street may appreciate the meaning of this latest invention the art must be reviewed in a measure, taking the Diesel motor as a basis of comparison. Back in 1893 Rudolph Diesel startled the engineering fraternity by bringing out his first oil engine, capable of developing but five horse-power. It was not the energy of that mechanism that compelled attention, but rather the operative cycle which Diesel employed and the developments it seemed to make possible.

Until then the internal combustion engine had depended upon either gas or gasolene, but the Diesel cycle demonstrated that it would be entirely practicable to use much cheaper fuels—crude oil and some of the low grade by-products of the refineries. Also, the functional phases of the Diesel motor materially helped along some of the engineering problems involved in the employment of gasolene as a source of energy, while the resultant efficiency was proved to be potentially much higher than when gasolene, the dangerously explosive lighter derivative of petroleum, was used. In short, the advent of the Diesel oil motor assured the adoption of the internal combustion engine in spheres where it had been held impossible so long as gasolene had been the logical fuel.

The Diesel motor (or, to be more exact, the Diesel principle) is now providing propulsive force upon a vast scale in many departments of industry and elsewhere. The "Diesel cycle" characterizes the designs of many types of internal combustion motors, and, thanks to the ingenuity of the German pioneer, engines capable of developing some thousands of horse-power each are doing work with resultant economies that would be quite out of the question if a steam plant were substituted.

Motor Ship Now Common.

Probably in no detail of its service has the Diesel motor accomplished more than for the driving of ocean going craft. The motor driven ship has become almost a commonplace in the few years since the enterprising Danes blazed the way. There are now in active service motor ships of nearly 10,000 tons dead weight—cargo vessels capable of making more than eleven knots and driven by machinery that can develop 3,100 horse-power.

It is a matter of record how strikingly self-sufficient the motor ship is, because she can carry her liquid fuel stored away where it would be out of the question to put coal and can take enough of it aboard to enable her to make a round trip of many thousands of miles without replenishment. No craft burning coal could do this without great sacrifice in space and weight, factors that have to be carefully considered where the vessel is engaged in commerce.

In a recent paper prepared by J. W. Morton of the United States Shipping Board which was read before the American Society of Mechanical Engineers comparative data were submitted for a vessel of 3,500 tons displacement having either a single steam engine or crude oil motors, the first developing 4,400 horse-power and the three Diesel units producing a total of 4,800 horse-power. Statistics plainly showed the advantages of the internal combustion installation.

As Mr. Morton brought out further: "A motor ship, in sharp contrast to the steamship, is always ready for action, as no time is lost in getting up steam. Moreover, fuel is consumed only when the motors are running, and the motor ship is capable of maintaining full speed as long as there is a supply of fuel. As there is no need for stokers on a motor ship the crew can be decreased about 10 per cent., and this, of course, permits of a corresponding saving in previsions, water storage and quarters."

Every ship owner knows that in the days ahead there is going to be the closest sort of competition among the cargo carriers of the world, and good profits are likely to be reaped only in the employment of vessels that can be run at good speeds and very economically. Therefore of craft of a given deadweight capacity and speed, freighters that will get the most out of every gallon of liquid fuel will be the ones to show the largest returns. And this brings us to the gas-steam engine, the Still engine, which now promises to make the motor ship a far more formidable rival of the regular steamship.

Still Motor's Advantages.

Our Vice-Consul at London lately reported to the Department of Commerce the broad advantages of the Still motor. As he explained, "with the ordinary gas or oil engine, one of the greatest mechanical problems is the removal of the heat generated by the combustion of the fuel, and in the majority of cases this heat is lost or wasted in the sense that it is not converted into useful work.

"In the new invention arrangements are made to utilize the waste heat for the generation of steam; and the piston, after being driven in one direction by gas or oil, is driven in the other by steam. By this means the inventor hopes to increase the fuel efficiency at least 20 per cent., and to increase the elasticity of the engine by storing steam in a reservoir so as to sustain for a short time a large overload, which would ordinarily stop the engine."

Without going into a maze of techical niceties, it will suffice to say that the energy of liquid fuel is due directly to the measure of heat developed during the period of combustion; and the problem of the engineer is to get work out of as much of this heat as possible before the hot gases are exhausted from the cylinders. In the Diesel engine the propulsive oil is not ignited by an electric spark, but is fired by the high temperature of the air compressed in the cylinder before the admission of the oil. The compression raises the temperature of the air to approximately 1,000 degrees Fahrenheit, which is well above the flashpoint of the oil.

Unlike the gasolene motor there is no explosion in the cylinder, and thus no violent shock when the fuel is lighted by contact with the highly compressed air. The charge burns evenly and generates its expansive force smoothly during the downward or yielding movement of the piston. As might be expected, a great deal of the heat developed during this period is absorbed by the enveloping walls of the cylinder, and is lost, as is also the residual heat in the gases which are forced out of the cylinder when the piston reverses its stroke. Because of the absorptive nature of the cylinder walls and their tendency to become red hot under the successive power strokes of the piston, it is customary to surround the combustion cylinder with a refrigerating water jacket.

The jacket, of course, draws the heat from the cylinder walls and the measure of this extraction is plainly indicated in many cases by the steaming temperature of the water discharged from this system. In fact, if the water did not flow freely it would be turned into steam and develop explosive pressures.

Liquid fuel, therefore, is wasted even under the conditions made possible by the best designs of Diesel motors. It is said that in the most economical of these motors it is feasible to obtain a thermal efficiency of from 25 to 26 per cent.—the remainder of the heat generated being lost through radiation or in the exhausted gases. However, it is authoritatively declared that this measure of efficiency can be realized only when the engines are new; before long they begin to drop below this mark. In the case of the most carefully designed steam turbines it is practicable to utilize 18.2 per cent. of the potential energy of the heat units stored in the coal burned. This shows how far steam propulsion, under the most favorable conditions, falls short of the Diesel performance. Keep these figures in mind in order to appreciate what is promised in the Still motor, which cuts down the heat losses to a notable degree.

Details regarding this engine were revealed some weeks ago at a meeting of the Royal Society of Arts in London, when a paper was read by Capt. F. E. D. Acland. (The developmental work on the Still engine was kept secret during the war.) As Capt. Acland has disclosed, the fundamental idea of the Still engine is to combine in a single motor the greater thermal efficiency of the internal combustion engine and the much lower thermal cycle of a steam driven machine by utilizing a very considerable percentage of the heat which now goes to waste.

To this end the heat that normally passes into the circulating water by radiation through the cylinder walls, or is discharged with the exhaust gases is used to generate steam, and the steam moves the piston one way, while the oil in the combustion chamber alternately drives it the other way. Normally, an internal combustion engine receives its power impulse only on one side of the piston, and the reverse stroke is the result of momentum. By his arrangement, Mr. Still puts his motor in the double acting class of the reciprocating engine, where steam for propulsive purposes is alternately admitted on each side of the cylinder, and every stroke is a power stroke.

What Still Strove For.

According to Capt. Acland's paper, contradictory as it may seem, Mr. Still's primary purpose is not really to raise steam by arresting the escape of what would otherwise be waste heat (i. e., energy), but instead to improve the operative conditions of the primary combustion cylinder in which liquid fuel is burned. He insures the oil being consumed at a higher degree of efficiency by reducing the amount of heat lost in that stage of the cycle. Clearly, the cooler the refrigerating medium circulating outside of the combustion cylinder the greater would be the radiation from the inflamed gases within the cylinder, and by just so much would the expansion of these gases be arrested and their push on the piston reduced.

How, then, does Mr. Still obviate this objectionable feature, which is common to all oil engines where the refrigerant is circulating water at a relatively low temperature? He does it by moving through the enveloping jacket a flow of water which communicates with a steam boiler or steam generator; the latter is an integral part of the circulating system. That is to say, this water is at a temperature of 350 degrees—138 degrees above boiling point. This, of course, is 650 degrees lower than the compressed air in the cylinder when the atomized oil is ignited and for that reason serves as a refrigerant while still keeping the cylinder walls hotter than would be the case ordinarily when cold water is employed.

The steaming water in the duplex engine passes from the jacket into a small boiler where, by means of an oil burner, a pressure is maintained of 120 pounds to the square inch. Next, the exhaust gases from the combustion cylinder are passed through a water heater, which is also linked with the boiler. These gases enter the heater at 900 degrees Fahrenheit and leave it at 400 degrees. The majority of the released 500 degrees is absorbed by the water, as is evidenced by its temperature on flowing to the jacket space around the combustion cylinder.

The steam for power purposes, which is tapped from the little auxiliary boiler, first enters a steam jacket which surrounds the steam cylinder, placed directly below the combustion cylinder, and is admitted by means of a suitable valve to the steam cylinder when the piston reaches the limit of its oil driven stroke. This gives a power impulse that effectually overcomes the dead load and the frictional losses which would otherwise represent a drain upon the energy developed at each operation of the combustion cylinder.

Shows Well in All Tests.

The first experimental Still engine developed 590 brake horsepower from three cylinders when making 400 revolutions a minute. At the start the fuel was illuminating gas, but this was subsequently replaced by oil. While the showing was not up to expectations, nevertheless an efficiency of 31.8 per cent. was obtained—an improvement of 71 per cent. upon the most efficient steam turbine and of nearly 23 per cent. upon the best of Diesel motors.

Engines of the Still type have been built and tested ashore and afloat, and the results are extremely encouraging. Both in England and elsewhere the Still system is being worked out for commercial marine service, and two-stroke single piston types, developing, respectively, 100 and 400 horsepower per cylinder, have been adopted. Engines of this character with a 22 inch by 36 inch cylinder at 120 revolutions a minute have given 4,200 shaft horsepower. With all auxiliaries and water they weigh approximately 600 tons. A geared turbine plant in a similar ship would weigh 20 per cent. more, and would consume, it is estimated, about 2,000 tons more fuel for a round-trip lasting 1,000 hours.

Manifestly, Americans cannot afford to be indifferent to this prime mover of British origin, used ashore or afloat, because it means fuel economies which will be of considerable moment. This applies equally to the factory, the machine shop and any sort of power installation where units of this character would answer; but probably these motors will be of the most conspicuous benefit in the realm of shipping. We must give serious heed to its adaptation to our own merchant marine at the earliest moment when motors of this nature can be employed without hesitation in our cargo carriers.

Chinese Hatch Chickens as Ancient Egyptians Did

THE methods used for applying heat in Chinese incubators in China are similar to those used by the Egyptians 4,000 years ago in similar incubators, ruins of which still exist in the Nile River Valley. On the first day the eggs are thoroughly warmed to the proper incubating temperature of 103 degrees Fah., or a little less, by placing them in a brick, ovenlike room, usually 6 feet deep, 12 feet long and 10 feet high. The eggs are placed in baskets arranged on shelves around the walls of this room, each basket holding 200 or 300 eggs. In the larger shops as many as forty or fifty of these baskets may be found in this oven at the same time. Heat is furnished by burning charcoal in earthenware pots placed on the floor of the room. Sometimes baskets of eggs are placed in large stone jars and a slow charcoal fire is kept burning continuously against or underneath the outside of the jar. This method is largely used at Shanghai, Hankow, and other places in the north where the climate is cooler, and constant application of heat is necessary through most of the hatching season.

After the eggs have been heated to the proper temperature, either in the oven or in the sun, they are placed in cylindrical baskets about 30 inches deep and 20 inches in diameter. Each basket holds about 1,000 eggs. The walls of the basket are about 1¼ inches thick, and are made of firmly packed rice straw held in place with wicker or bamboo, both inside and outside. The baskets are lined with a heavy gray paper, somewhat like asbestos. This paper and the basket itself is thoroughly warmed before putting in the eggs, which are arranged in layers, each layer being separated from its neighbor by a piece of cloth about two feet square. Twice a day the eggs are changed from one basket to another. The operator simply grasps the corners of the cloth, and in so doing the eggs naturally tumble together in a heap in the centre. He then transfers it with the eggs to another basket. This method takes the place of the slow method of turning eggs used with modern incubators and is most efficient, requiring only about one-tenth the time. Transferring the eggs from one basket to another by this method also gives the airing considered necessary for the production of strong, healthy chickens.

The eggs are usually kept in the baskets fourteen days, and then transferred to large trays, 6 feet wide, 18 feet long and 3 inches deep. Each tray holds about 10,000 eggs. The bottom of the tray is lined with the same heavy paper with which the baskets are lined. The eggs are also covered with this paper, with blankets or with both. The amount of coverings depends, of course on the weather and the period of incubation. In warm weather no covers are needed during the last two or three days. Just before hatching time, the number of eggs in the trays is reduced to one layer, and an empty space of about two feet is left at one end, toward which the eggs are turned or rolled twice a day.

The eggs are candied twice, usually on the third and seventh days, and all infertile eggs are sold so that there is very little loss through unhatched eggs. Throughout the incubation period careful watch is kept over the temperature. No thermometer is used, but the operator raises the lid or a blanket, removes an egg and presses the large end against a closed eyelid where the skin is very sensitive to temperature. Long practice has taught him to judge differences in temperature quickly and accurately. The men sleep in the room with the eggs, or in adjoining rooms. Some one is on duty constantly, examining and regulating each basket or tray according to its individual needs.

The chickens when hatched are placed in circular bamboo trays about three feet in diameter and eight inches deep. They are ready for sale as soon as dry. The hatching percentage usually runs about 75 per cent. of the fowl eggs and about 90 per cent. of the duck eggs. This average hatch is quite fair, and, with better sanitation, ventilation and construction of buildings, and the use of thermometers, this method of hatching eggs on a large scale would be far more economical and efficient than hatching chickens in any of our so-called modern incubators.